Review | Limits, Asymptotes

explain $\lim_{x\to 2} x^2+1=5$

to someone not in calculus

as x gets closer to 2, y gets closer to 5

$\lim_{x\to 1} \frac{x^2-1}{x-1}$

$\lim_{x\to 1} \frac{(x+1)(x-1)}{(x-1)} = 2$

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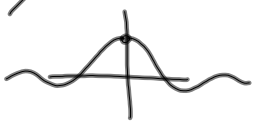
memorize

$\lim_{x\to 0} \frac{\sin x}{x} = 1$ ← y-coord of hole

$\lim_{x\to \infty} \frac{\sin x}{x} = 0$



$\lim_{x\to \infty} \left(1+\frac{1}{x}\right)^x = e$

$\lim_{x\to \infty} \left(\frac{x+1}{x}\right)^x = e$

$\lim_{x\to \infty} \left(\frac{x}{x+1}\right)^x = \frac{1}{e}$

$\lim_{x\to 0^+} \ln x = -\infty$

graphs help

Feb 27-9:58 AM

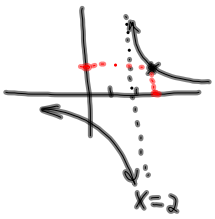
explain $\lim_{x\to 2^+} \frac{1}{x-2} = \infty$

to someone not in calculus

as x approaches 2 from the right

y gets bigger (grows without bound)

no limit



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$\lim_{x\to \infty} f(x) = L$ HA $y=L$

$\lim_{x\to a} f(x) = \infty$ VA $x=a$

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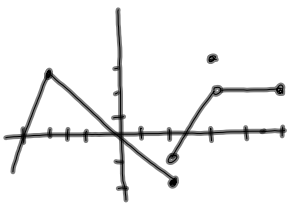
2 sided limits, 1 sided

$\lim_{x\to 2} f(x) =$ dne

because lhl ≠ rhl

$\lim_{x\to 2^-} f(x) = -2$

$\lim_{x\to 2^+} f(x) = -1$



$\lim_{x\to 3} f(x) = 2$

$\lim_{x\to -1} f(x) = 1$

$\lim_{x\to -3} f(x) = 3$

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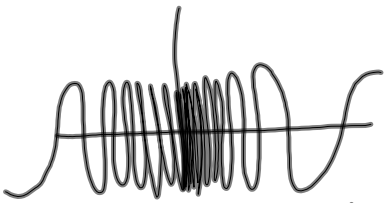
$\lim_{x\to 0} \sin\left(\frac{1}{x}\right) =$ dne

diverges by oscillation



this side & this side never hook up

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